FIG. 1

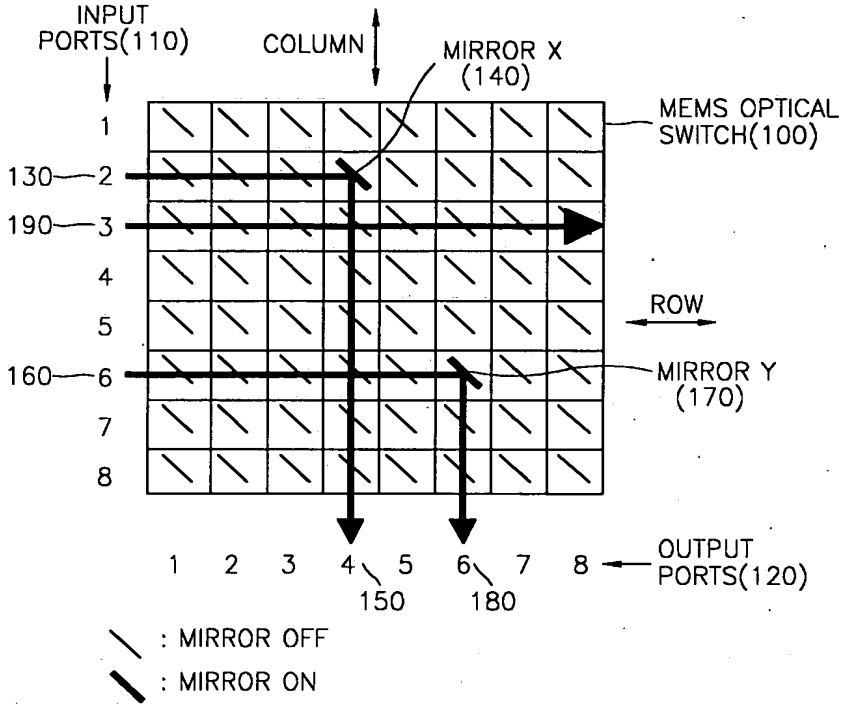

INPUT PORTS(110)
COLUMN
MIRROR X (140)
MEMS OPTICAL SWITCH(100)
130
190
160
1
2
3
4
5
6
7
8
ROW
MIRROR Y (170)
1 2 3 4 5 6 7 8
OUTPUT PORTS(120)
150
180
: MIRROR OFF
: MIRROR ON

FIG. 2A

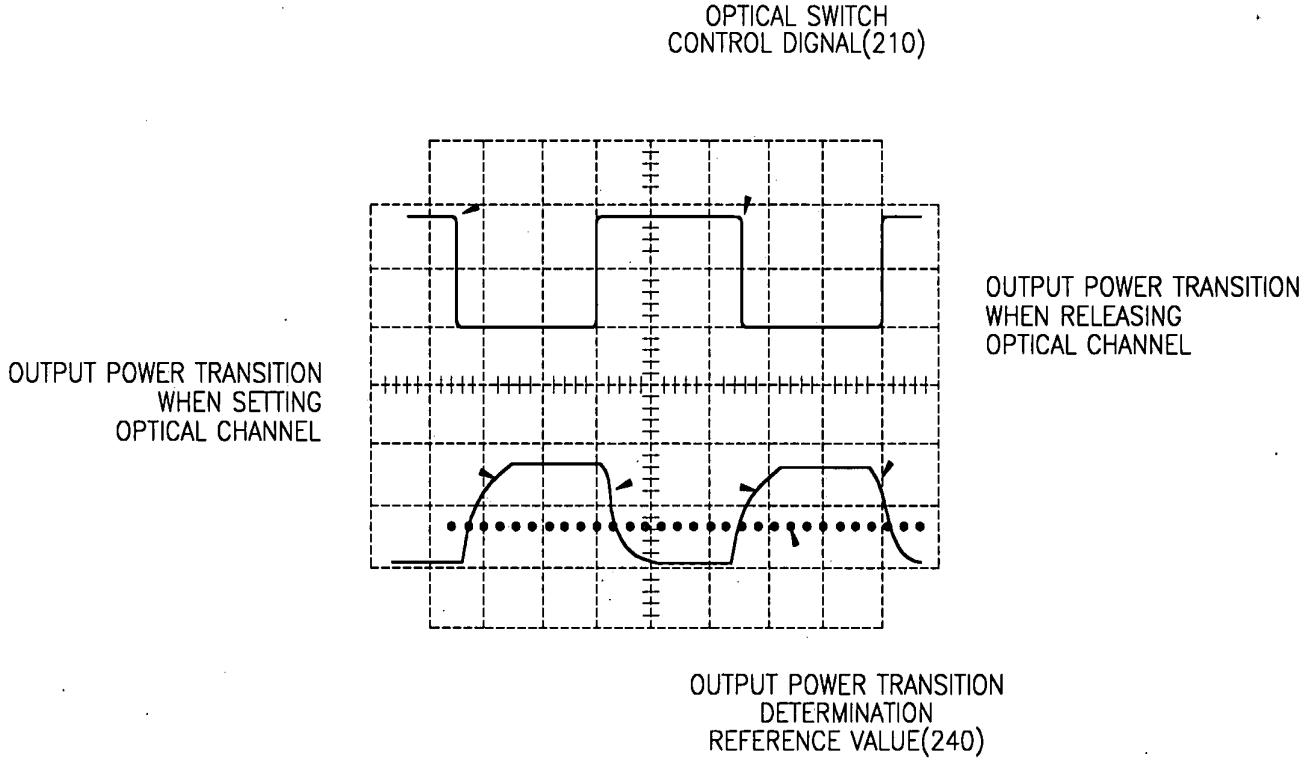

OPTICAL SWITCH
CONTROL DIGNAL(210)
OUTPUT POWER TRANSITION
WHEN SETTING
OPTICAL CHANNEL
OUTPUT POWER TRANSITION
WHEN RELEASING
OPTICAL CHANNEL
OUTPUT POWER TRANSITION
DETERMINATION
REFERENCE VALUE(240)

FIG. 2B

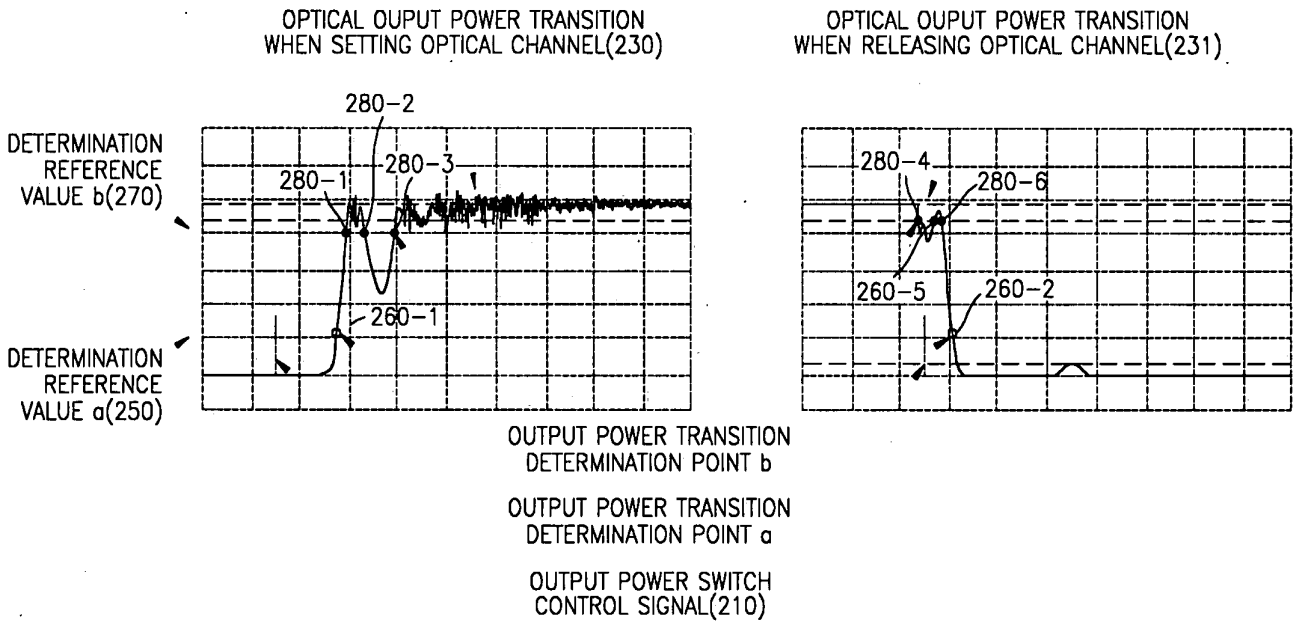

OPTICAL OUPUT POWER TRANSITION
WHEN SETTING OPTICAL CHANNEL(230)
OPTICAL OUPUT POWER TRANSITION
WHEN RELEASING OPTICAL CHANNEL(231)
DETERMINATION
REFERENCE
VALUE b(270)
DETERMINATION
REFERENCE
VALUE a(250)
280-1
280-2
280-3
280-4
280-6
260-1
260-2
260-5
OUTPUT POWER TRANSITION
DETERMINATION POINT b
OUTPUT POWER TRANSITION
DETERMINATION POINT a
OUTPUT POWER SWITCH
CONTROL SIGNAL(210)

FIG. 3

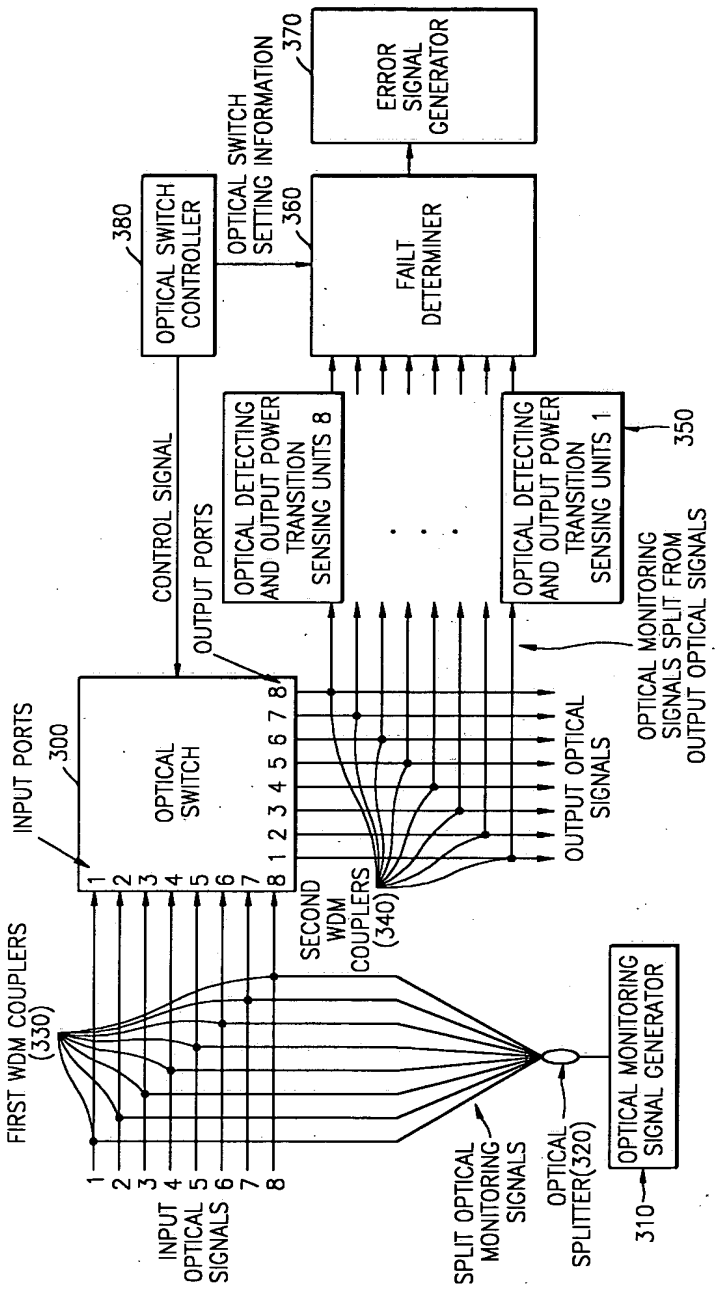

INPUT PORTS
300
OPTICAL SWITCH
1 2 3 4 5 6 7 8
OUTPUT PORTS
CONTROL SIGNAL
380
OPTICAL SWITCH CONTROLLER
OPTICAL SWITCH SETTING INFORMATION
360
FAILT DETERMINER
370
ERROR SIGNAL GENERATOR
OPTICAL DETECTING AND OUTPUT POWER TRANSITION SENSING UNITS 8
OPTICAL DETECTING AND OUTPUT POWER TRANSITION SENSING UNITS 1
350
OPTICAL MONITORING SIGNALS SPLIT FROM OUTPUT OPTICAL SIGNALS
OUTPUT OPTICAL SIGNALS
SECOND WDM COUPLERS (340)
FIRST WDM COUPLERS (330)
INPUT OPTICAL SIGNALS
SPLIT OPTICAL MONITORING SIGNALS
OPTICAL SPLITTER(320)
OPTICAL MONITORING SIGNAL GENERATOR
310

FIG. 4

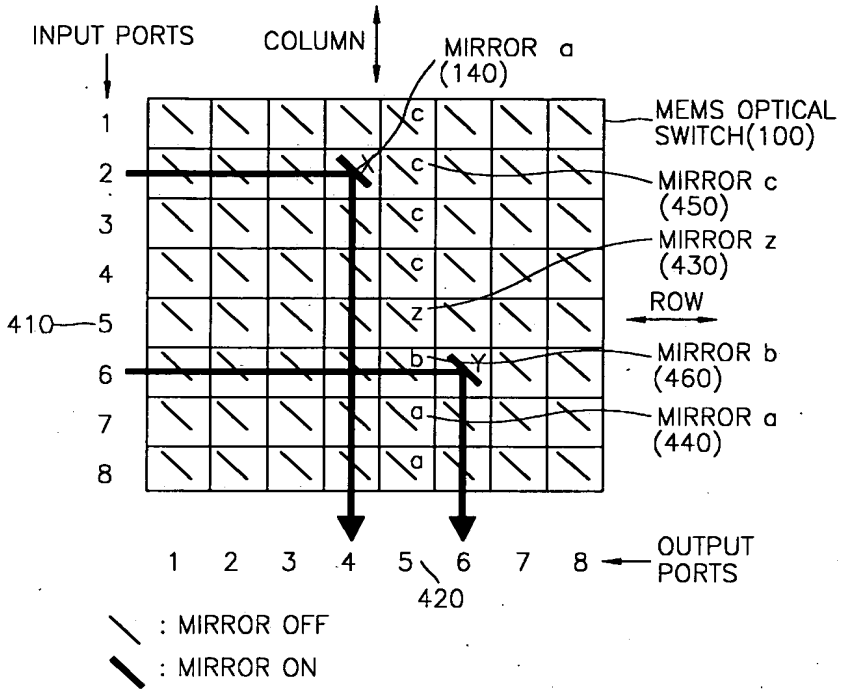

INPUT PORTS
COLUMN
MIRROR a
(140)
MEMS OPTICAL
SWITCH(100)
MIRROR c
(450)
MIRROR z
(430)
ROW
MIRROR b
(460)
MIRROR a
(440)
410
420
OUTPUT
PORTS
: MIRROR OFF
: MIRROR ON

FIG. 5

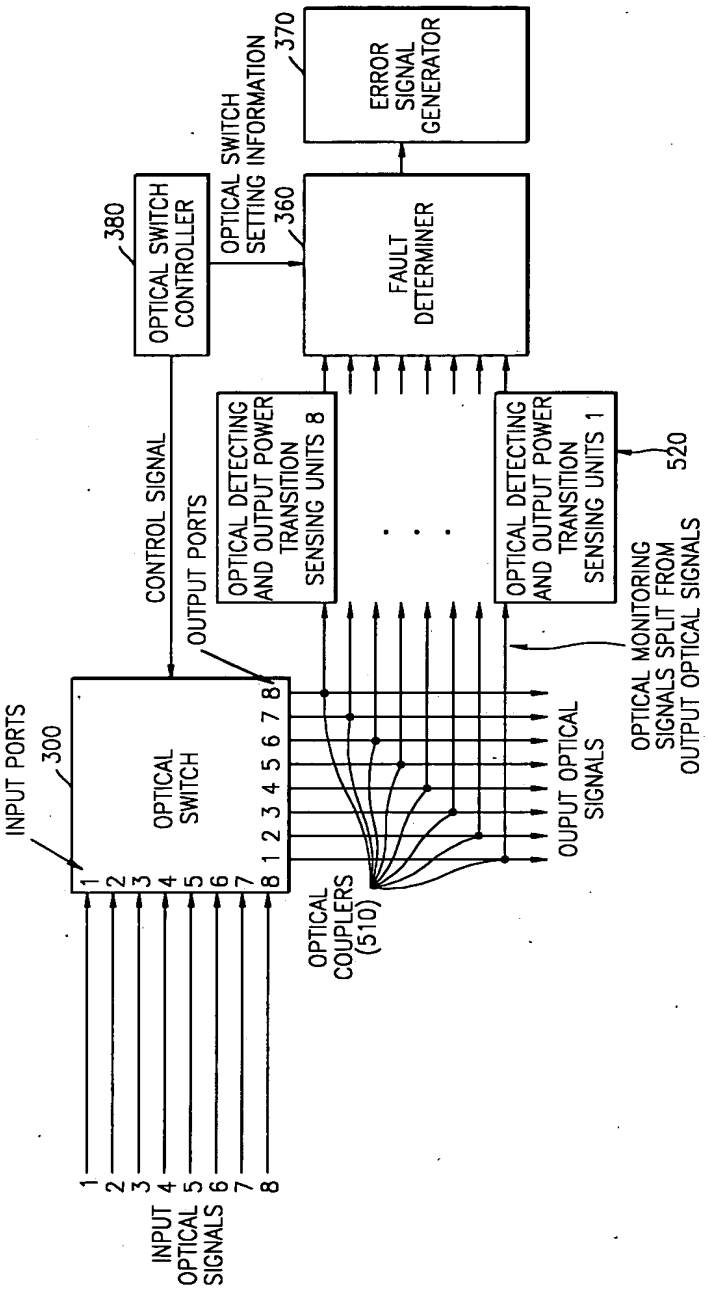

INPUT PORTS
300
OPTICAL SWITCH
1 2 3 4 5 6 7 8
INPUT OPTICAL SIGNALS
1 2 3 4 5 6 7 8
CONTROL SIGNAL
OUTPUT PORTS
OPTICAL SWITCH CONTROLLER
380
OPTICAL SWITCH SETTING INFORMATION
360
FAULT DETERMINER
ERROR SIGNAL GENERATOR
370
OPTICAL DETECTING AND OUTPUT POWER TRANSITION SENSING UNITS 8
OPTICAL DETECTING AND OUTPUT POWER TRANSITION SENSING UNITS 1
520
OPTICAL COUPLERS (510)
OUPUT OPTICAL SIGNALS
OPTICAL MONITORING SIGNALS SPLIT FROM OUTPUT OPTICAL SIGNALS

FIG. 6

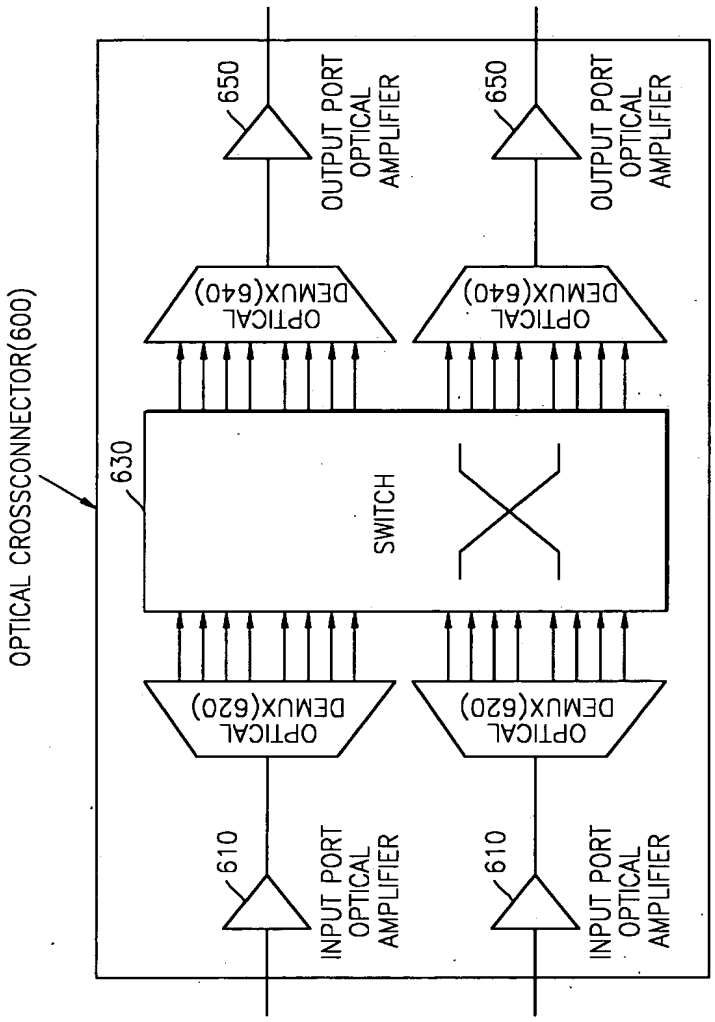
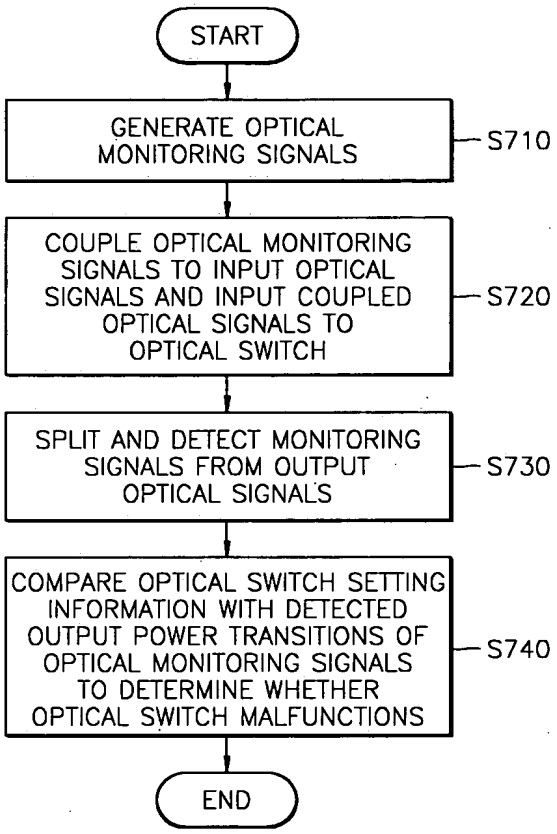

OPTICAL CROSSCONNECTOR(600)
630
SWITCH
650
OUTPUT PORT OPTICAL AMPLIFIER
650
OUTPUT PORT OPTICAL AMPLIFIER
OPTICAL DEMUX(640)
OPTICAL DEMUX(640)
OPTICAL DEMUX(620)
OPTICAL DEMUX(620)
610
INPUT PORT OPTICAL AMPLIFIER
610
INPUT PORT OPTICAL AMPLIFIER

FIG. 7


START
GENERATE OPTICAL MONITORING SIGNALS
S710
COUPLE OPTICAL MONITORING SIGNALS TO INPUT OPTICAL SIGNALS AND INPUT COUPLED OPTICAL SIGNALS TO OPTICAL SWITCH
S720
SPLIT AND DETECT MONITORING SIGNALS FROM OUTPUT OPTICAL SIGNALS
S730
COMPARE OPTICAL SWITCH SETTING INFORMATION WITH DETECTED OUTPUT POWER TRANSITIONS OF OPTICAL MONITORING SIGNALS TO DETERMINE WHETHER OPTICAL SWITCH MALFUNCTIONS
S740
END